

What is claimed is:

- 1 1. A system for evaluating engine cylinder contribution comprising:
2 a displacement measurement device configured to detect engine block movement
3 relative to a stationary structure; and
4 a signal analyzer coupled to the displacement measurement device and configured
5 to evaluate the engine block movement.
- 1 2. The system of claim 1, wherein the displacement measurement device comprises
2 a potentiometer having a shaft with a first end and a second end, wherein the first end is
3 attached to the engine block and the second end is attached to the stationary structure.
- 1 3. The system of claim 1, wherein the engine block is mounted to the stationary
2 structure.
- 1 4. The system of claim 1, wherein the displacement measurement device comprises
2 a piezo cable having a first end and a second end, wherein the first end is attached to the
3 engine block and the second end is coupled to an input port of the signal analyzer.
- 1 5. The system of claim 1, wherein the displacement measurement device comprises
2 a cable, wherein the cable has a resistance that is proportional to strain.
- 1 6. The system of claim 1, wherein the displacement measurement device comprises
2 a laser device.
- 1 7. The system of claim 1, wherein the displacement measurement device comprises
2 a machine vision device.
- 1 8. The system of claim 1, wherein the displacement measurement device comprises
2 at least one of a vibration sensing device and a sound sensing device.
- 1 9. The system of claim 1, further comprising:

2 a signal cable configured to couple the displacement measurement device and the
3 signal analyzer, the signal cable for providing a displacement signal to the
4 signal analyzer.

1 10. The system of claim 9, wherein the signal analyzer further comprises:
2 an input port configured to receive the displacement signal; and
3 a processor coupled to the input port and configured to examine a voltage change
4 on the displacement signal.

1 11. The system of claim 1, wherein the signal analyzer further comprises:
2 a connection network configured to send and to receive data;
3 a communications interface coupled to the connection network and configured to
4 interface the signal analyzer to the displacement measuring device;
5 a processor coupled to the connection network and configured to receive a
6 displacement signal corresponding to the engine block movement; and
7 a memory coupled to the connection network and configured to store the
8 displacement signal.

1 12. The system of claim 11, further comprising:
2 a display screen coupled to the connection network and configured to display the
3 displacement signal.

1 13. The system of claim 11, wherein the processor is further configured to compute
2 cylinder contribution from the displacement signal.

1 14. The system of claim 1, further comprising:
2 a cylinder clip coupled to a first ignition wire and configured to provide a trigger
3 signal for the signal analyzer.

- 1 15. The system of claim 14, wherein the first ignition wire corresponds to a first fired
2 cylinder in a firing order for the engine.
- 1 16. The system of claim 1, further comprising:
2 a distributor clip coupled to an ignition coil and configured to sample the ignition
3 coil voltage.
- 1 17. A method for measuring cylinder contribution for an engine having a firing order,
2 the method comprising the steps of:
3 implementing a displacement measuring device for detecting engine block
4 movement relative to a stationary structure;
5 correlating the engine block movement to the firing order; and
6 evaluating, for at least one engine cylinder, the engine block movement.
- 1 18. The method of claim 17, further comprising:
2 attaching a first end of the displacement measuring device to the engine block.
- 1 19. The method of claim 18, further comprising:
2 attaching a second end of the displacement measuring device to the stationary
3 structure.
- 1 20. The method of claim 18, further comprising:
2 attaching a second end of the displacement measuring device to a signal analyzer.
- 1 21. The method of claim 17, wherein the engine block is mounted to the stationary
2 structure.
- 1 22. The method of claim 17, further comprising:
2 displaying at least one of the cylinder contribution and the engine block
3 movement for at least one engine cylinder.

- 1 23. The method of claim 17, wherein the correlating step further comprises:
2 obtaining a trigger signal from a first cylinder; and
3 relating the trigger signal to the firing order of the engine.
- 1 24. The method of claim 23, wherein the relating step further comprises:
2 adjusting the relationship between the observed engine block movement and the
3 trigger signal according to an engine parameter.
- 1 25. The method of claim 17, wherein the evaluating step further comprises:
2 determining a cylinder contribution from the engine block movement.
- 1 26. The method of claim 25, wherein the determining step includes computing a
2 derivative of the engine block movement.
- 1 27. A system for measuring cylinder contribution for an engine, the system
2 comprising:
3 means for monitoring engine block movement relative to a fixed position;
4 means for correlating the engine block movement to cylinder firing order; and
5 means responsive to the monitoring and the correlating means for evaluating, for
6 at least one engine cylinder, engine block movement.
- 1 28. The system of claim 27, further comprising:
2 means responsive to the correlating means for determining cylinder contribution.